

## **Reconfigurable Computing: Innovative Technology for Scientific Community**

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Reconfigurable Computing marks a revolutionary and hot topic that bridges the gap between the separate worlds of hardware and software design. The key feature of reconfigurable computing is its groundbreaking ability to perform computations in hardware to increase performance while retaining the flexibility of a software solution. Reconfigurable computers serve as affordable, fast, and accurate tools for developing designs ranging from single chip architectures to multi-chip and embedded systems. Given the architecture and design flexibility, reconfigurable computing has catalyzed the progress in hardware-software code sign technology and a vast number of application areas such as scientific computing, biological computing, artificial intelligence, signal processing, security computing and control oriented design. We give an overview of the hardware architectures of reconfigurable computing machines, and the software that targets these machines, such as compilation tools. Also, we consider the issues involved in run-time reconfigurable systems, which re-use the configurable hardware during program execution.

Keywords: Reconfigurable computing, ASIC, FPGA, Signal Processing, VHDL

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